Revision History

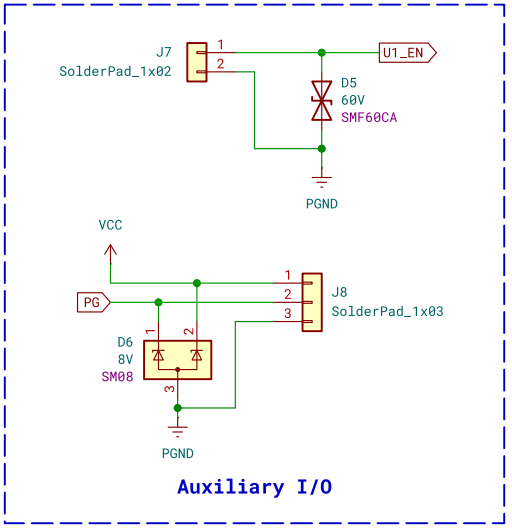
Model	Revision	Date	Description
SSDP3A0	A	2025-07	Concept design using the LM70880 buck converter and LM5069-1 hotswap controller. Abandoned due to supply chain issues and cost constraints.
SSDP3A1	A	2025-08	Concept design using the LM5146 buck controller and TPS2490 hotswap controller. Abandoned due to space and cost constraints.
SSDP3A2/SSDV3	A	2025-09	Concept design using the LM5146 buck controller in a custom 1/8th brick form factor. Accepted design for revision.
SSDV3	B	2025-10	Concept design using the cheapest parts available on LCSC. Limited part availability and NRND parts made future production of this revision difficult.
SSDV3	C	2025-10	Prototype design featuring reverse polarity protection in exchange for a smaller TVS diode on the input. Smaller, active-production PQFN-8 FETs used in place of SO-8 FETs. Used for preliminary integration testing and validation.
SSDV3	D	2025-11	Production revision from Rev. C., addressing issues found in testing: - Fixed electrolytic input capacitor unprotected from reverse polarity. - Added missing thermal vias for CSD19537Q3 footprints. - Replaced RPP ground diodes with 100V rated diodes. - Revised capcaitor selection for higher temperature rating: X5R -> X7R. - Copper pour patching. - Refactored schematic for A4 paper.

rpp

File: rpp.kicad_sch

buck_converter

File: buck_converter.kicad_sch



Auxiliary I/O

M3 Mounting Holes

H1 MountingHole
H2 MountingHole
H3 MountingHole
H4 MountingHole

JLCPCB Eco PCBA Tooling Holes

H5 MountingHole
H6 MountingHole
H7 MountingHole

HS1
567-45AB

CAUTION
HOT SURFACE

Mechanical

A 12S battery eliminator circuit (BEC) for UAS applications.

Author: Julian Joaquin

Sheet: /
File: SSDV3.kicad_sch

Title: Super Step Down V3

Size: A4	Date: 2025-11-08	**Rev: D**
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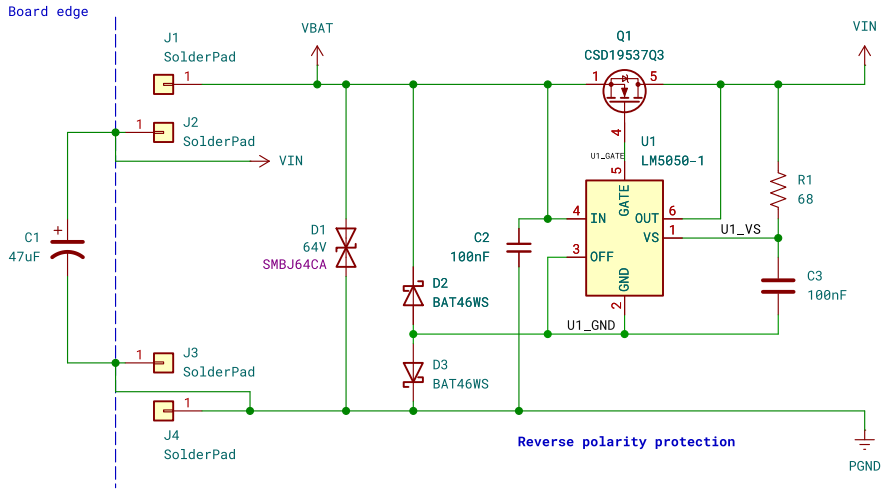
V_{IN} = 20~60V (70V slow transient)
typ. 6~12S Li-Ion/LiPo Battery

Attach XT60-M connector via wires to pads



PWR_FLAG — PGND
PWR_FLAG — VBAT
PWR_FLAG — U1_GND

A 12S battery eliminator circuit (BEC) for UAS applications.

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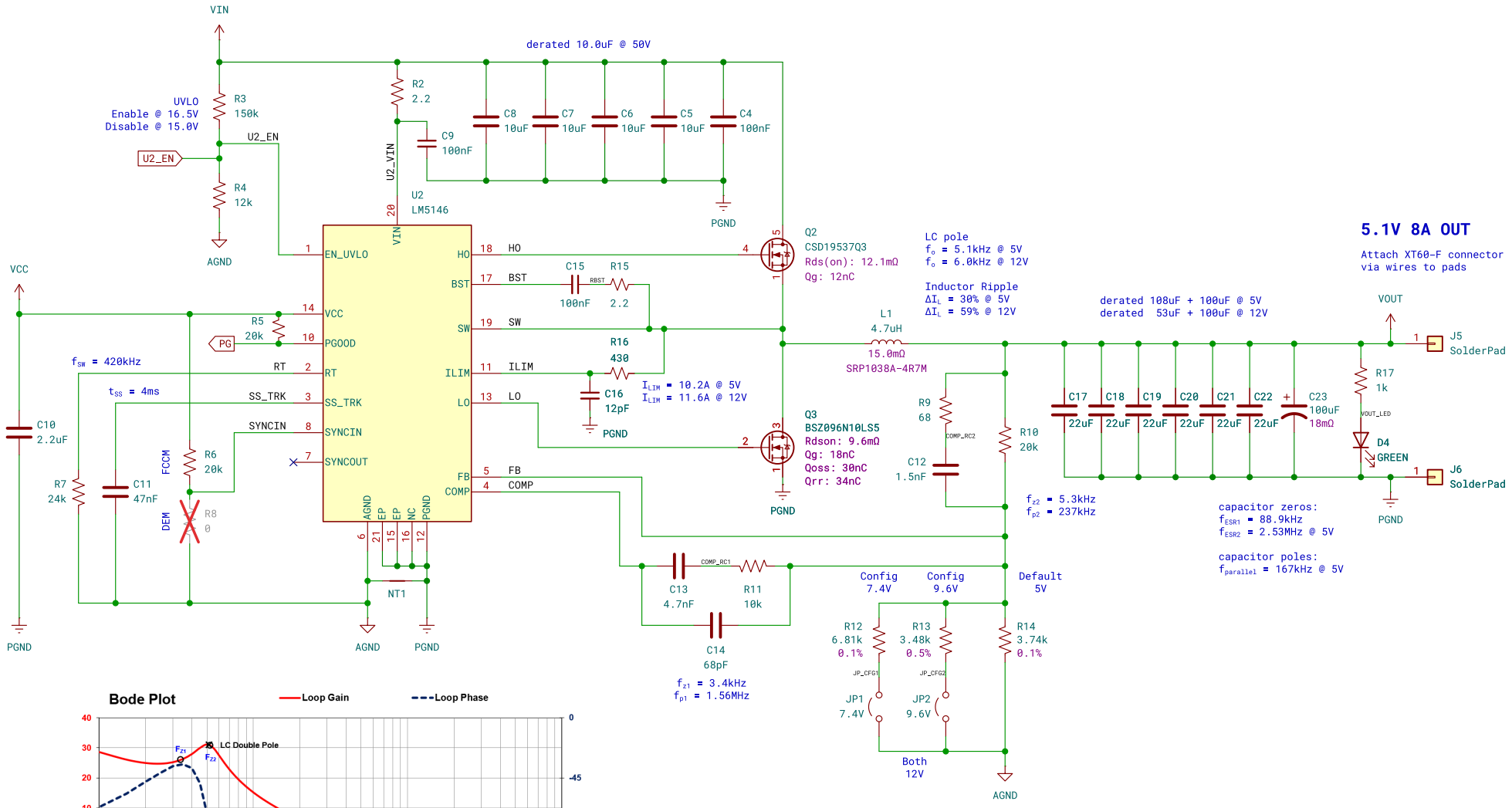

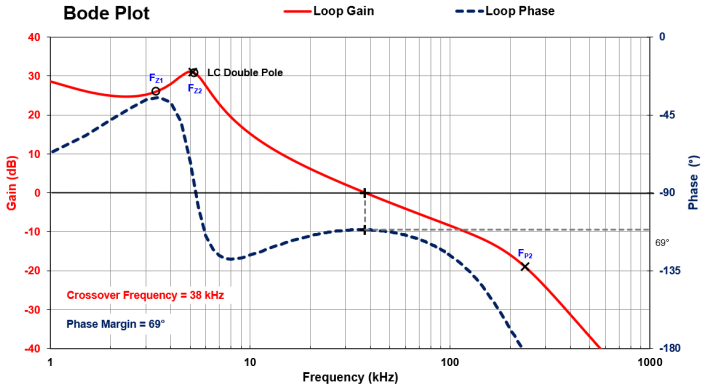

Stability Analysis of Compensation @ 5V

PWR_FLAG ◇→ VIN
PWR_FLAG ◇→ AGND
PWR_FLAG ◇→ VCC
PWR_FLAG ◇→ VOUT
PWR_FLAG ◇→ U2_VIN

A 12S battery eliminator circuit (BEC) for UAS applications.

Author: Julian Joaquin

Sheet: /buck_converter/
File: buck_converter.kicad_sch

Title: Super Step Down V3

Size: A4	Date: 2025-11-08	**Rev: D**
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